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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,703	08/03/2005	Heikki Ruotoistenmaki	1016050-000084	4982

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EXAMINER	
STOUT, MICHAEL C	

ART UNIT	PAPER NUMBER
3736	

NOTIFICATION DATE	DELIVERY MODE
09/16/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/525,703	RUOTOISTENMAKI, HEIKKI	
	Examiner	Art Unit	
	MICHAEL C. STOUT	3736	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6,7 and 9-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6,7,9-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This detailed action is in regards to United States Patent Application 10/525703 filed on 8/3/2005 and is in response to amendment filed 6/23/2008.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

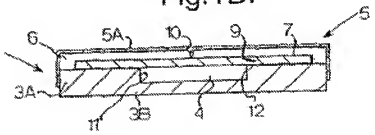
The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 4, 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freakes et al. (WO 2002/31461 A1) in view of Bagdassarian et al. (US 4393321), Reuter (US 4974679) and Kusakabe et al. (EP0710827) and in further view of Sasaki et al (US 5,889873) and in view of Cullen et al. (US 4,422,055).

Freakes teaches a force or pressure sensor, comprising a substantially rigid, mechanical-load resistant frame (frame 3A), a flexible diaphragm secured over its peripheral rim to the frame (substrate 7), and a piezoelectric sensor diaphragm applied to the surface of the flexible diaphragm (SAWs device Y is laid down on the substrate, see Page 5, Paragraph 2) wherein the sensor diaphragm loading element comprises a substantially rigid cover capable of carrying mechanical loading (lid 5 which functions as a diaphragm and transmits a load via member 10 to substrate 7) wherein the cover includes a protrusion or shoulder (projection 10), bearing against a middle section of the flexible diaphragm and thus (see Figure 1B),

Fig.1B.



by deflection, prestressing the flexible diaphragm and the piezoelectric sensor diaphragm attached thereto (a recess 10 is formed in the lid and presses on the central region of the substrate, see Abstract and Page 5, Paragraph 4), and wherein the frame and the cover define therebetween a closed housing chamber (see Figure above), the flexible diaphragm and the piezoelectric sensor diaphragm being located there inside (see Figure 1B). Freakes in view of Reuter teaches the device wherein the frame, cover and the flexible diaphragm are rotationally symmetrical relative to the cover protrusion or shoulder (Freakes teaches a device wherein the frame, cover and flexible

diaphragm are symmetrical about the cover protrusion, see Figure 1A). Freakes fails to teach the SAW diaphragm comprised of a piezoceramic material. Bagdassarian teaches a SAW device comprised of piezoceramic substrate, see Figure 1 and Column 4, Lines 35-45). Both Freakes and Bagdassarian teach SAW devices. Thus it would have been obvious to a person of ordinary skill in the art to modify the device taught by Freakes to include piezoceramic material as taught by Bagdassarian in the SAW diaphragm in order to provide a material to ensure acoustic wave propagation because when there is a design need or market pressure to solve a problem and there are a number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product is not of innovation but of ordinary skill and common sense. Reuter teaches a load cell having a cover capable of carrying a mechanical loading of more than 50 kg (the button in Figure 1E is preferred for load cells with more than 50kg ratings, see Column 5, Lines 23-31). Both Freakes and Reuter teaches load sensing devices. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device taught by Freakes by making the cover capable of carrying mechanical loading of more than 50kg as taught by Reuter in order for the device to operate in environments requiring at least a 50kg load to be detected thereby increasing the usability of the sensor, see Column 5, Lines 23-31. Freakes fails to teach the device comprising a sensor-signal transmitting contact spring is in contact with the sensor diaphragm opposite to the cover protrusion or shoulder. Kusakabe teaches a device wherein the

sensing elements are connected to a circuit board via wires located opsoited a protrusion (8), see Figure 2 in order to detect a pressure and amplify a signal. Both Freakes and Kusakabe teach pressure sensor devices. Thus, it would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device taught by Freakes to include wires connecting a circuit board and amplifier in the housing as taught by Kusakabe in order to provide a pressure detecting circuit connected to the diaphragm elements and provide a means for adjusting the gain of the circuit, see Kusakabe Column 7, Lines 35-50, and provide a pressure sensor suitable for detecting combustion pressure (abstract). Kusakabe fails to teach the device wherein the connection is made using spring contacts. Sasaki teaches a piezoelectric diaphragm device wherein a signal is transmitted using spring contact (323, see Figure 2) in order to dispense with the complicated and time consuming process of soldering, see Column 1, Lines 23-49. Thus it would have been obvious to a person of ordinary skill in the art to modify the device taught by Freakes to include circuitry as taught by Kusakabe in order to detect pressure and amplify signals by using a spring contact as taught by Sasaki in order to avoid the time consuming process of soldering. Freaks fails to teach the device wherein the piezoelectric diaphragm is rotationally symmectrical about the center of the diaphragm. Cullen teaches a pressure transducer wherein the sensor diaphragm 29 and 39 are rotationally symmetrical about the center of the device, see Figure 1. It would have been obvious to a person of ordinary skill in the art to modify the device disclosed by Freakes by symmetrically placing the sensor diaphragm symmetrically about the center of the diaphragm by Cullen in order to increase the

sensitivity of the device because a force delivered by the protrusion will be acting directly above the SAW element. Regarding claim 10, Freakes further teaches the sensor wherein the closed housing chamber is hermetically sealed (the lid and base materially are preferably impermeable to gas and the seal between the lid and the base is also preferably impermeable to gas, see Freakes Page 5, Paragraph 1). Regarding claim 6, Kusakabe teaches a pressure sensor wherein an amplifier (121) and a circuit board (20) are located in a housing chamber, see Figure 1 and Column 7, Lines 35-50, in order to provide a pressure detecting circuit connected to the diaphragm elements and provide a means for adjusting the gain of the circuit, see Kusakabe Column 7, Lines 35-50. Regarding claim 4, Freakes/Bagdassarian teaches the device wherein the piezoelectric ceramic sensor diaphragm comprised of a piezoceramic diaphragm (see Bagdassarian Figure 1 and Column 4, Lines 35-45), having a diameter smaller than that of the flexible diaphragm (See Freaks Figure 1A), and the piezoceramic sensor diaphragm has a peripheral rim at a distance from the inner periphery of the housing chamber (see Freaks Figures 1A and 1B shows the edge of the SAW diaphragm a distance from the inner periphery of the housing chamber).

Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freakes et al. (WO 2002/31461 A1) in view of Bagdassarian et al. (US 4393321), Reuter (US 4974679) and Kusakabe et al. (EP0710827) and in further view of Sasaki et

al (US 5,889873) and in view of Cullen et al. (US 4,422,055) as applied to claim 1 above, and further in view of Guscott et al. (US 4228379).

Regarding claim 3, Freakes teaches the device wherein the flexible diaphragm comprised of a substrate (7), having its peripheral rim secured between the edges of the frame and the cover (substrate may be secured to the base by means of an adhesive, see Freakes Page 5, Paragraph 3, Figure 1 shows the substrate is secured between the edges of top of the frame and inside cover). Freakes fails to teach the device wherein the diaphragm is metal. Guscott teaches a transducer device comprising a metal diaphragm. Both Freakes/Reuter and Guscott teach transducer devices. Thus, it would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device taught by Freakes/Reuter to include a metal diaphragm as taught by Guscott in order to employ a metal diaphragm which has improved immunity to environmental and aging conditions, see Guscott Column 2, Line 60 through Column 3, Line 8. Regarding claim 7 Freakes teaches the device wherein fame and cover are made of bodies. Freakes fails to teach the device wherein the frame and cover comprise elements in the shape of bodies of revolution. Guscott teaches a transducer device wherein the cover (28) and frame (22) and diaphragm (10) are rotationally symmetrical wherein the frame and cover comprise elements in the shape of bodies of revolution.

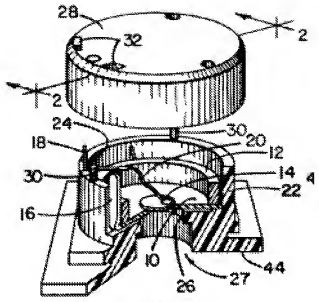


FIG. 1

Both Freakes/Reuter and Guscott teach transducer devices. Thus, it would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device taught by Freakes/Reuter to include a rotationally symmetrical frame and cover comprised of bodies of revolution as taught by Guscott in order to proved a circular unit which can be incorporated into fluid pressure monitoring devices connected to circular tubes and because circular frames, covers and diaphragms, covers and frames are all old and well known in the art.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freakes et al. (WO 2002/31461 A1) in view of Bagdassarian et al. (US 4393321), Reuter (US 4974679) and Kusakabe et al. (EP0710827) and in further view of Sasaki et al (US 5,889873) and in view of Cullen et al. (US 4,422,055); and in further view of Zhang (US 5,847,599).

Regarding claim 9, Freakes/Kusakabe teaches the device wherein comprising an amplifier. Freakes/Kusakabe fails to teach the device wherein the amplifier has its input impedance matched to provide a desired settling time of the amplifier's output, during which the amplifier has its output set substantially to zero, while the loading applied to the cover respectively remains essentially unchanged. Zhang teaches an amplifier for a sensor wherein the amplifier has input impedances matched (the settling time (the response time for a amplifier to return to its zero state after a step response input) is a function of capacitances associated with the amplifier with alter the impedances of the respective input signals, see Column 4, Lines 6-19), to provide a desired settling time. Both Freakes/Kusakabe and Zhang teach amplifiers for sensor device. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the device taught by Freaks/Kusakaba to include a matched impedance as taught by Zhang in order to provide a settling time sufficient enough to record rapid changes in the sensor output.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freakes et al. (WO 2002/31461 A1) in view of Bagdassarian et al. (US 4393321), Reuter (US 4974679) and Kusakabe et al. (EP0710827) and in further view of Sasaki et al (US 5,889873) and in view of Cullen et al. (US 4,422,055) in view of Viduya (US 5706372)

Freakes in view of Reuter teaches the sensor of claim 1 as set forth above, wherein the cover comprises the upper part of the housing of the device and is configured to measure fluid pressure. Freakes fails to teach the sensor wherein the cover is provided with an adapter element which enables loading of the cover with changes in a fluid or gas pressure. Viduya teaches a device wherein the housing comprises an adapter element (threads 14) for fastening the sensor device to a cylinder to measure fluid pressure.

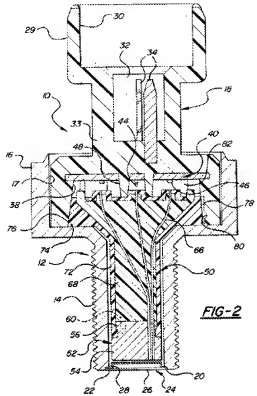


FIG-2

Both Freakes/Reuter and Viduya teach pressure sensor devices. Thus it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the device cover taught by Freakes/Reuter to include an adapter element as taught by Viduya in order to allow for the fastening of the device to a cylinder for measuring fluid, see Column 2, Lines 15-25).

Conclusion

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Arguments

The Applicant's amendment(s), see Drawings and Claims, filed 6/23/2008, with respect to the claims and drawings overcome the previous objections. The objections of Figure 1 and Claims 8, 3, 4 and 9 have been withdrawn.

2. Applicant's arguments filed 6/23/2008 have been fully considered but they are not persuasive. The Applicant argues that because freaks does not disclose the weight bearing capability of the lid, " one skilled in the art would conclude that the load bearing element is substrate 7 (as is conventional) and the lid has its only functions to seal the pressure monitoring device and to transmit the pressure force to the substrate 7."

3. The Examiner Disagrees. Freakes discloses the lid acts as a diaphragm and transmits a load applied to its surface to the substrate via a projection 10, therefore the

lid is capable of bearing a load and transmitting it to the substrate, see Freaks Page 5. In regards to the applicants augments that Reuter is another type of load cell than Freaks. Reuter teaches the importance of the load bearing elements, which Freaks teaches as the cover and diaphragm, being capable of withstanding a load of 50kg, and it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the cover taught by Freaks to be capable of carrying a load of more than 50kg, and is discussed in the above rejection. Regarding the applicants arguments that Kusakabe shows different pressure sensing elements or relates to the problem or solution of the claimed invention. The Examiner Disagrees, because Kusakabe is relied upon for connections and amplifiers not the teaching of a piezoceramic sensor, and the applicants claimed invention is a pressure sensor, which Kusakabe teaches a pressure sensor, having a variety of uses one of which is detecting changes in pressure in a combustion chamber, see Page 7 of Applicant's specification.

4. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., inventive sensor for measuring extremely small changes of force or pressure simultaneously with high loading of the sensor) are not positively recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The Applicants arguments that Sasakie fails to teach the spring contact sensor with the sensor diaphragm opposite to the cover protrusion or shoulder. The Examiner Disagrees. As cited in the above rejection Kusakabe/Sasaki

teaches the recited limitations. Kusakabe teaches as sen in Figure 1 electrical connections in contact with the sensing elemnts opposite the should or cover protrusion 8, and Sasaki teaches the used of spring contacts for forming electrical connections in order to dispense with the complicated and time consuming process of soldering.

Contact Info

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL C. STOUT whose telephone number is (571)270-5045. The examiner can normally be reached on M-F 7:30-5:00 Alternate (Fridays).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max Hindenburg can be reached on 571-272-4726. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. C. S./
Examiner, Art Unit 3736

/Max Hindenburg/
Supervisory Patent Examiner, Art Unit 3736